Chapter 3

ADDING YOUR OWN DATA TO MAPS

Introduction

C2020 mapping software contains numerous data from the U.S. Census that you can illustrate in maps, but you may also want to create or import your own data and illustrate it in maps. Fortunately, C2020 allows users to import data (such as retail sales figures, lists of properties, or crime statistics) and graphically represent these in maps. The software is compatible with most name brand database programs, such as Lotus, FoxPro, and Microsoft Access and Excel.

Problem Statement

Your boss just handed a sheet of paper to you that lists local hospitals and she provided exact street addresses for only some of the hospitals. She wants you to use C2020 to create a database for the hospitals using C2020's User Projects tool, and she wants a map illustrating the locations of the hospitals. How do you create the database and print the two maps within 30 minutes?

She also gave you a floppy disk that contains a dBASE file of dozens of schools in the metropolitan area. She wants you to use C2020 to create a map within 30 minutes illustrating the locations of each school with three unique icons to differentiate high schools from elementary and middle schools.

IN THIS CHAPTER

What You Will Learn in Chapter 3

- In Exercise 1 you will learn how to enter basic information about projects into a database using the User Projects tool. You will then learn how to view these projects on a map.
- In Exercise 2 you will learn how to open a data file containing a list of properties and make a map layer to show this information on a map.
- In Exercise 3 you will make your map clearer and more persuasive by providing different icons for the different property types in your map and by changing the map legend.

Introduction to Exercise 1: Proposing Your Own Projects

In this exercise you will use the User Projects button to create a database of basic information on city properties—a hospital and a day care center—and then create a map layer illustrating the locations of these properties/projects on a map. As you will see, it is possible to create a database for properties and illustrate their locations on a map even if you do not know their exact street addresses.

What You Will Learn in Exercise 1

In this exercise you will learn how to:

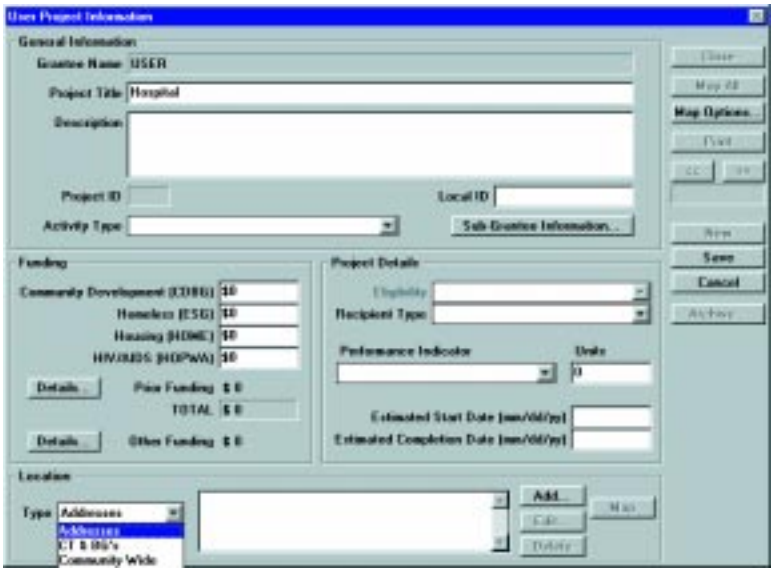
- Create a record in a database for a project for which you know the exact street address.
- Add a record in a database for a project for which you do not know the exact street address but for which you know the general location.

Using the User Projects Button

Steps

To create a database for a property for which you know the exact street address:

1. **Click on the User Projects button**  in the HUD toolbox. In the resulting dialog box, ***choose Create a New User Project. Click OK.***
2. All data boxes are optional except for Project Title and Location. ***Click in the Project Title box and type "Hospital."*** Under Location Type in the lower left corner, ***select Addresses*** from the dropdown menu. ***Then click on Add.***



3. ***Enter the street address and ZIP Code in the Address Info dialog box.*** You do not need to provide the city or State. For this example ***type "1547 Argyle Avenue"*** under street and ***"21217"*** under ZIP Code. (We selected this property because it is located within the "My Neighborhood" marker.) ***Click OK.***
4. C2020 will confirm that it successfully located the address. ***Click OK.***
5. In the User Projects Information dialog box, ***click on Save*** to add the proposed project to the User Projects layer. (**Note:** when you load the software, C2020 creates a user projects layer automatically on the computer's hard drive.) This project will now appear whenever you add the User Projects layer to any map.

Steps

To add a project for which you do not know the exact street address but do know its general location:

6. ***Click on the New button*** at right in the User Project Information dialog box to open a blank form.
7. ***Give this new project the title "Day Care Center"*** under Project Title. ***Choose Addresses*** as the Location Type in the lower-left dropdown menu. You cannot enter a street address for this property because you do not know it. Instead, ***click on Save.*** Next ***close the User Project Information*** dialog box.
8. Using the Map Library button, open the following map:
   - ***Location: My Neighborhood***
   - ***Category: User Projects Maps***
   - ***Map: User Project Locations***
9. An icon and label representing the location of the hospital should appear on the map. No icon will appear for the day care center because you have not yet provided any location information. To add this icon to the map, ***choose HUD, Location Tools,*** from the Main Menu. The Location Tools dialog box appears. ***Select Day Care Center*** from the Project dropdown menu as shown below:

10. **Click on the title bar** on the top of the Location Tools dialog box and drag the dialog box away from the center of your screen.
11. **Click on the Add Project Location button**  . The Address Info dialog box appears. Click on a point on a street in the map where you want an icon to appear to represent the location of the day care center. Next, type the name of that street

and at least the ZIP Code in the Address Information dialog box that appears. (**Note:** the ZIP Code should be the same as for the hospital.) ***Click OK*** to close the dialog box. The day care center is now added to your map.

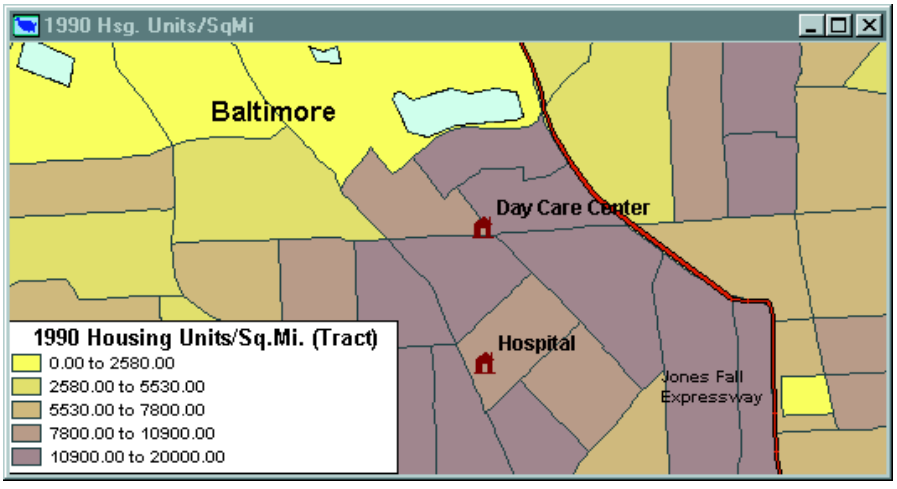
12. **Select the Activity Information button**  and **click on either the hospital or day care center icon.** The User Project Information dialog box appears displaying the information you entered for each project. ***Click on the Close button*** to return to the map.

13. The User Projects layer containing the hospital and day care center is available to us now to add to any map. To add this layer to another map, you must determine first where this file is stored in the computer and what it is called. To do this, **click on the Map Layers button**  to list all map layers, then ***click on the User Projects layer.*** In the lower left part of the Layers dialog box, you will see the name and location of the file where the software is storing the user projects layer (for example, C:\COMM2020\HUD\U_PROJL.DBD).

    You will now open a map and add this layer to illustrate the locations of the hospital and day care center in the new map. **Click on the Map Library button and make the following selections:**

    - ***Location: My Neighborhood***
    - ***Category: Housing Information***
    - ***Map: Housing Units/Sq. Mile***
    - ***Year: 1990***

    When the map opens, **select the Map Layers button** again, ***click on the Add Layer button,*** and add the User Projects layer. The following map illustrates 1990 housing information and the User Projects in the "My Neighborhood" marker. You will need to label and restyle the icons to make them appear as illustrated below:



Introduction to Exercise 2: Adding Local Properties to Your Map

As we will see in this exercise, C2020 Planning Software includes powerful tools for importing data and illustrating the data in maps.

What You Will Learn in Exercise 2

In this exercise you will learn how to:

- Open a dBASE file that comes from any spreadsheet or database software. In this exercise you will open a list of properties and their addresses.
- Prepare a table so that it contains the information needed to turn it into a map layer.
- "Geocode" a table to turn it into a map layer.

Each property location in the table will appear as an icon in the new map layer. You will be able to add this layer to any map.

Steps

Before opening the dBASE file that contains a list of properties located in My Neighborhood, open a map onto which you can later place the icons representing the locations of the properties.

1. **Open the following map:**
   - ***Location: My Neighborhood***
   - ***Category: General Purpose Maps***
   - ***Map: Road Map***

The following map should appear:

Notice that one layer on this map is "Streets." It is important to open a map containing the Streets layer because you will use this layer when you "geocode," that is, to add location information to your database records.

Opening Your Database File as a Table

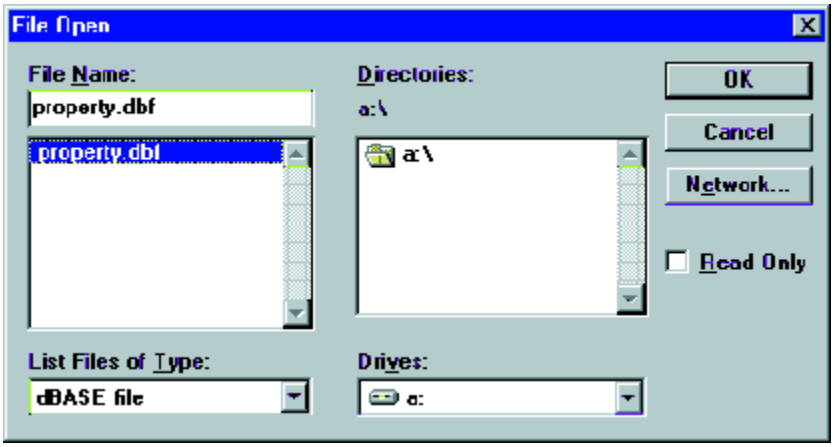
The next step will be to open the file containing the table of local properties. You can view and change just about any data in a table, whether it was stored in a spreadsheet or a database. The only requirement is that it be saved as a dBASE file (that is, a file with the suffix ".dbf"). This is a file format option in most spreadsheet programs such as Microsoft Excel or Lotus 1-2-3.

If you are going through this manual on your own, you can download a sample database file that will allow you to follow the exercises in this book. It is located at **http://www.hud.gov/cpd/c2020/manual/cmanhome.html.** There you will find a data file called "property" that matches the data in this exercise exactly. If you have the Eastern Edition or Deluxe Edition of the software, we recommend that you download this file. When you save this file, be sure to attach the extension ".dbf" to the file name.

If you have the Western, Southern, or Central Edition of the software you can download files appropriate for those regions. You will use Los Angeles, California, or Billings, Montana, for the Western Edition; Madison, Wisconsin, for the Central Edition; and San Antonio, Texas, for the Southern Edition. The data fields and number of records are slightly different from what you will see in this exercise, but you should be able to follow along.

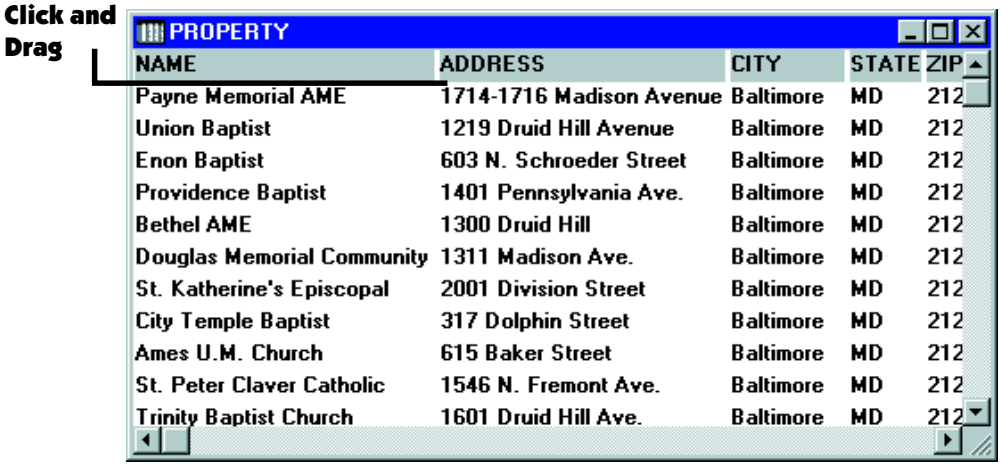
After downloading the file, you will be ready to open the file. This exercise illustrates opening the dBASE file from a disk.

2. ***Choose File, Open.*** The File Open dialog box appears. ***Make the selections in this order, as shown below: Drive, Directory, List Files of Type, File Name.***



(**Note:** you can proceed with step two and the remainder of this exercise provided you have any dBASE file that has headings for each column and has a column containing valid street addresses.) ***Click OK.***

The PROPERTY dataview window appears, as shown below. You can resize the columns by clicking and dragging the vertical space bars that separate each column.



Preparing Your Table

Now that you have opened the PROPERTY table as a database file in the software, the addresses are almost ready to be geocoded as points. Geocoding refers to the process of assigning each address in your table a latitude and longitude. The software can then display an icon at the appropriate place on a map.

C2020 software will geocode property addresses if it has the following two pieces of information for each property in the table:

- **The Geographic location.** An address; as you can see, the PROPERTY table already has street address information.
- **A unique identifier.** The software has to keep each record in a table distinct from the others, so it needs a unique ID or serial number. But since the housing property entries do not have unique identifiers, you will have to add one to each. Fortunately, the software makes this easy to do.

Adding a Unique ID to Your Table

There are a number of ways to add unique identifiers to your table. In the next few steps, you will add a column of sequential numbers (1, 2, 3, etc.) to your table, so that each housing property has its own unique number.

3. ***Choose Dataview, Modify Table,*** on the Main Menu.

4. The Modify Table dialog box appears. ***Click on the Add Field button.***

5. In the lower portion of the Modify Table dialog box, ***enter the Field Information as shown below:***

   You are almost finished, but don't click on OK just yet. In this exercise you will want to see your new column immediately to the left of the dataview table. To do this, the UNIQUE_ID field has to be at the top of the list in the Modify Table dialog box.

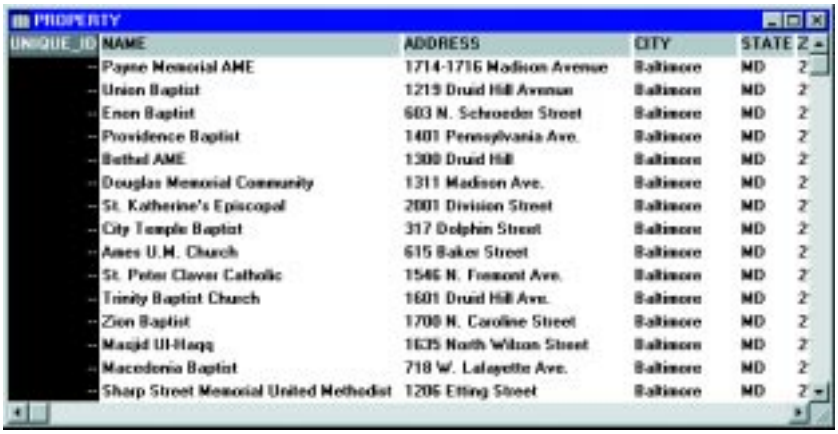
   But as you can see, UNIQUE_ID is at the bottom of the Field information list. To remedy this, you will use the Move Up button.

6. Make sure the UNIQUE_ID field is highlighted, then ***click on the Move Up button*** until the UNIQUE_ID field is repositioned at the top of the list. ***Click OK.***

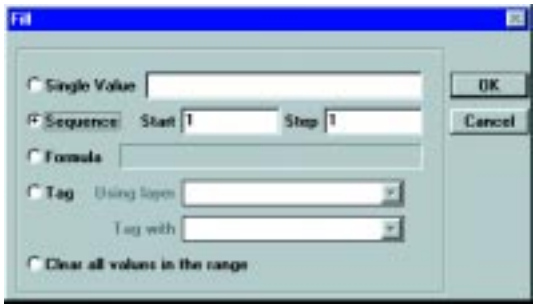
   The PROPERTY dataview now displays the UNIQUE_ID column that you just added to the left side of the table.

   As you can see, although there is a column to show each property's unique ID, there are no ID numbers yet in the column. The software allows you to enter the values manually, but there is an easier way: the Fill command. The Fill command will automatically generate ID numbers for each property.

7. First ***select the Unique ID column*** by clicking once on the word "Unique_ID." Note that the entire column is selected:



8. ***Choose Edit, Fill.*** The Fill dialog box appears and presents options for your column settings. Make the following selections and ***click OK:***



Note that each record now has a unique ID number.

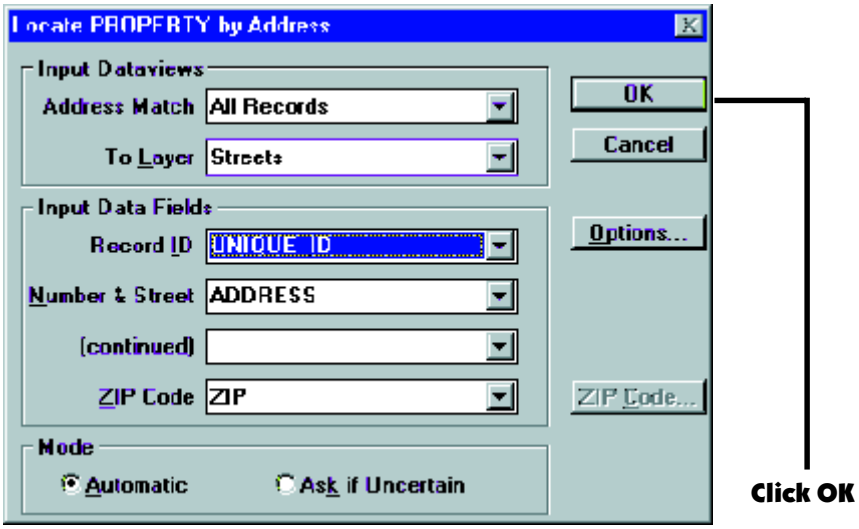
Creating a Map Layer by Geocoding Your Table

Now you are ready to geocode the data in your table. A new map layer will be created automatically once your table has been geocoded. Each housing property in your table will be represented by an icon on the new map layer.

9. ***Choose Tools, Locate by Address.*** The Locate PROPERTY by Address dialog box appears with the name of your table.

   Because you want to match all of the entries in the table, select All Records from the Address Match pulldown menu. And because the address information in the table consists of street addresses, you will tell the software to look for matches in the Streets layer by selecting Streets on the To Layer pulldown menu.

In the Input Data Fields area of the dialog box, select UNIQUE_ID as the Record ID. This instructs the software to locate one property for each record in the UNIQUE_ID column. When finished, ***click OK.***



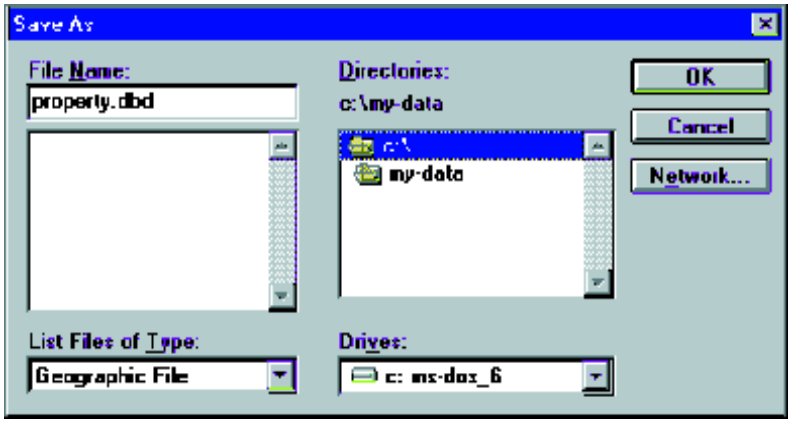
Saving the New Map Layer

The Save As dialog box will appear. You are being asked to save this automatically created new layer, which displays the locations of the geocoded records. You will save the geocoded addresses as a standard geographic file with the ".dbd" extension. Geographic files with this extension can be modified, unlike those with ".cdf" (compact digital file) extensions. For more information, see the FYI text box in the margin.

FYI

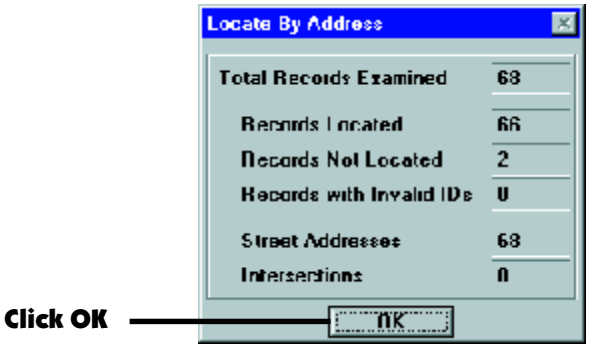
Recall that two file formats are available for saving map layers. One format, with the ".cdf" suffix, is compact and displayed quickly, but you can't make changes to it. The other format, with the ".dbd" suffix, is a larger format and displays more slowly, but it allows you to make changes.

10. ***Save your layer as "property.dbd" by choosing the options indicated below:***

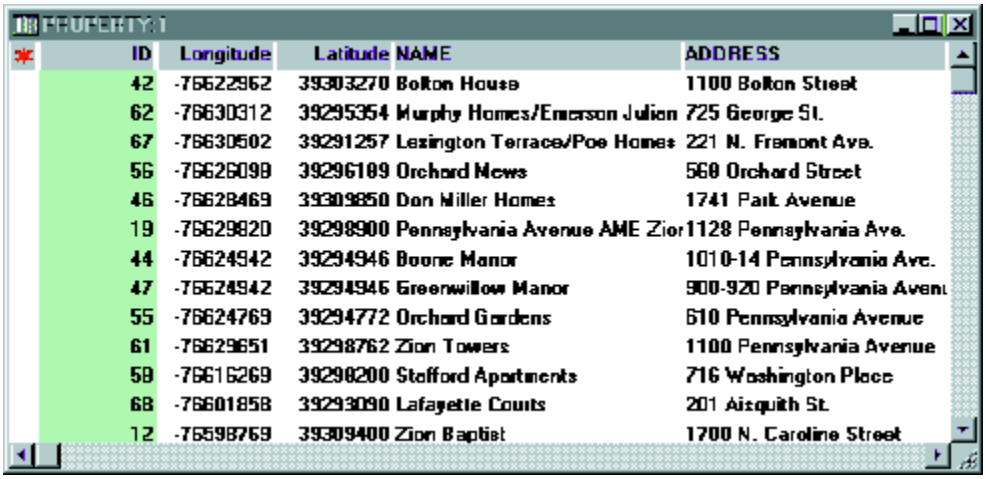


After you ***click OK in the Save As dialog box,*** you will see status bars showing the software's progress as it geocodes the records in the database.

11. When the software is finished, it will display a report of the located records, as illustrated below. As you can see in this dialog box, two property addresses in the Streets layer could not be located. This is because the properties are missing valid property address information.



Now that the PROPERTY table has been geocoded, you will notice a new dataview window. The first dataview shows the original property table itself; the new dataview (below) represents the data in the new map layer that was created from the original table.


PROPERTY:1

*	ID	Longitude	Latitude	NAME	ADDRESS
	42	-76622962	39303270	Bolton House	1100 Bolton Street
	62	-76630312	39295354	Murphy Homes/Emerson Julian	725 George St.
	67	-76630502	39291257	Lexington Terrace/Poe Homes	221 N. Fremont Ave.
	56	-76626099	39296109	Orchard Mews	560 Orchard Street
	46	-76628469	39309850	Don Miller Homes	1741 Park Avenue
	19	-76629820	39298900	Pennsylvania Avenue AME Zion	1128 Pennsylvania Ave.
	44	-76624942	39294946	Boone Manor	1010-14 Pennsylvania Ave.
	47	-76624942	39294946	Greenwillow Manor	900-920 Pennsylvania Avenu
	55	-76624769	39294772	Orchard Gardens	610 Pennsylvania Avenue
	61	-76629651	39298762	Zion Towers	1100 Pennsylvania Avenue
	59	-76616269	39298200	Stafford Apartments	716 Washington Place
	68	-76601858	39293090	Lafayette Courts	201 Asquith St.
	12	-76598769	39309400	Zion Baptist	1700 N. Caroline Street

Looking at the New Map Layer Dataview

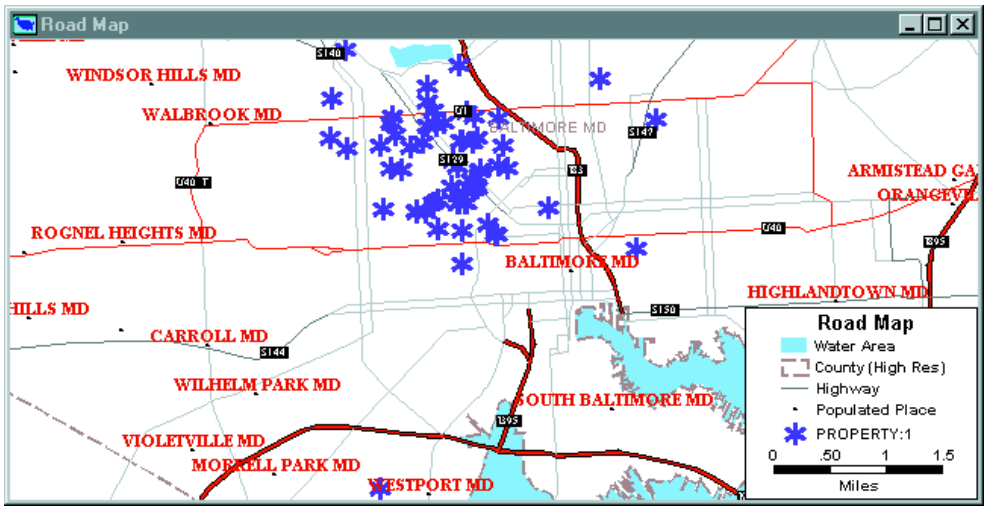
You will notice four differences between the original table and the new map layer dataview:

- The dataview of the new map layer shows the name “PROPERTY:1” in the title bar. The software automatically named the new layer by adding “:1” to the end of the name of the original table, to keep the two distinct.
- The PROPERTY:1 dataview has a column called “ID” that corresponds to the UNIQUE_ID column in the original table.
- PROPERTY:1 has two new columns to the right of ID to indicate the longitude and latitude coordinates for each address located.

- PROPERTY:1 has a new column to the left of ID. This column contains an asterisk to mark each address in the table that could not be geocoded because of missing or invalid address information.

Looking at the New Map Layer

Return to your map by making it the active window *(click on Window, Road Map, from the Main Menu).* Notice that the map legend shows the new map layer "PROPERTY:1." The map now displays a large asterisk in the PROPERTY:1 layer for each address in the table that it could find by referencing the Streets layer.



Saving Your Map

Because you changed the Road Map that you opened in step 1 by adding a layer (geographic file) containing asterisks to illustrate the locations of housing properties, it is a good idea to save your changes.

12. ***Choose File, Save As, and save your map as "property.map" in C:\my-data.***

Do not close your map yet—you will be using it in the next exercise.

Wrapping Up

Congratulations. You have just learned how to open your own data file, geocode the data, create a map layer showing your data, and save the file for use as a layer in other maps.

In the next exercise, you will learn to alter the appearance of the map symbols that represent property locations.

Introduction to Exercise 3: Customizing Your Properties Map

A map is an effective communications tool only if it is easy to understand. To help you make your map as clear and informative as possible, C2020 provides tools to tailor the graphic style of every element in your map, from individual map-layer features to entire map layers and the map's legend.

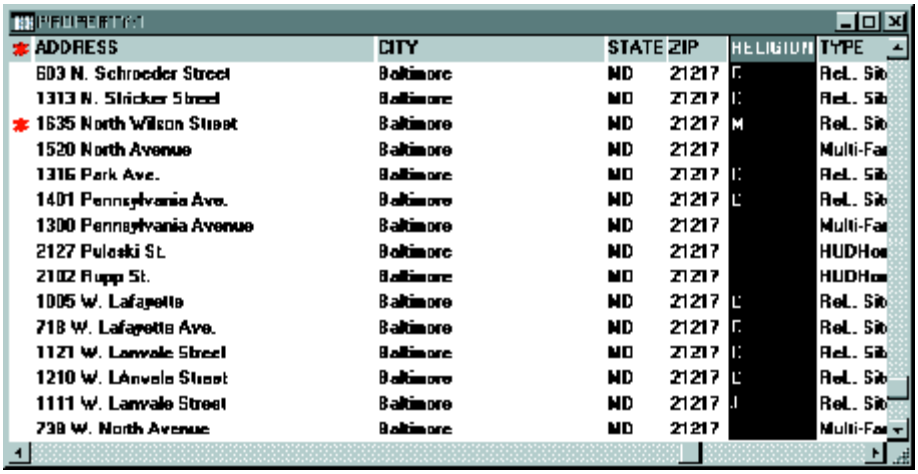
What You Will Learn in Exercise 3

In this exercise you will learn how to:

- Use the Color Theme MapWizard tool to customize the icons representing churches, synagogues, mosques, and HUD properties.
- Simplify and enhance the map legend by customizing the legend text.

Showing Categories Within a Layer

C2020 software allows you also to assign symbols of different sizes, shapes, and colors to different categories of map layers (for example, types of housing properties, types of places of worship, etc.). From the Main Menu, click on ***Window, PROPERTY:1.*** Scroll to the right to the RELIGION column. Scroll down this column and you will see that all of the records can be divided into four categories: Christian; Jewish; Muslim; and Other (C, J, M, and a blank space, respectively), as shown below. Select Religion by clicking once on the word.



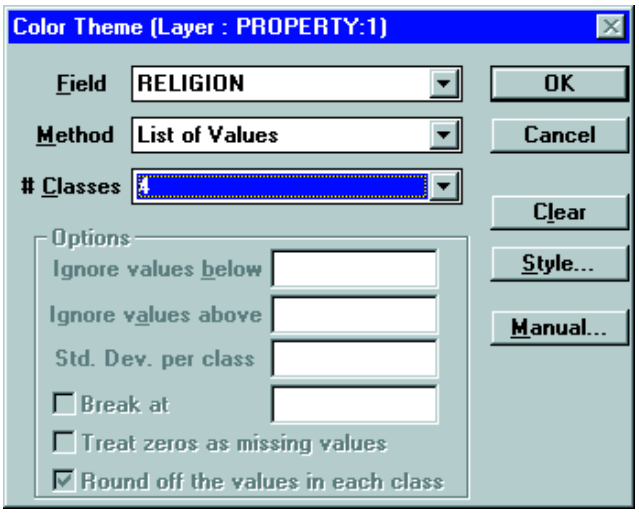
Changing the Color Theme

To assign different styles to different categories of map features, you will use the Color Theme MapWizard tool.

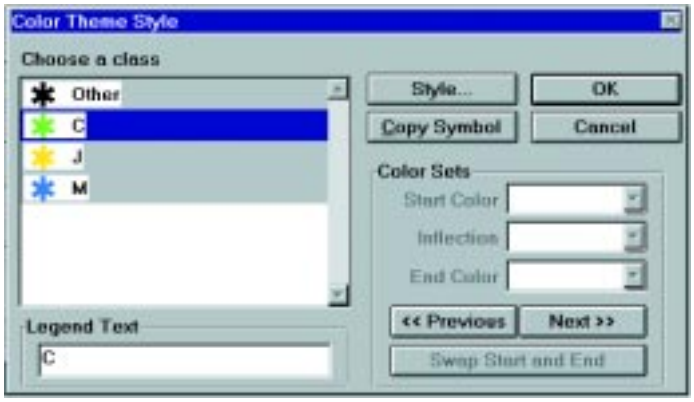
1. **Click on your map to make it the active window. Click on the Color Theme MapWizard button**  on the main toolbar. Make sure PROPERTY:1 is your

working layer. The Color Theme dialog box appears. The Color Theme dialog box allows you to change the graphic style and the legend text for each category within a field. The field you will use is RELIGION.

2. **Make the selections indicated below.** Note that the software refers to categories as "Classes" in the Color Theme Style dialog boxes.

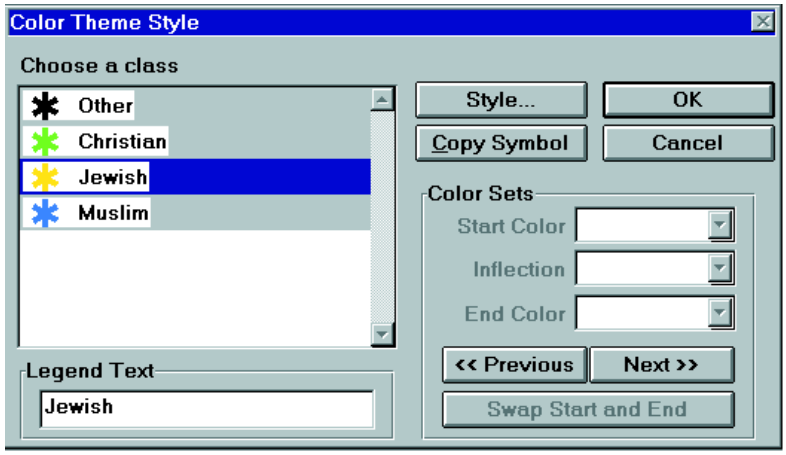


Next ***click on the Style button.*** The Color Theme Style dialog box will appear, as shown below:



3. With the Color Theme Style dialog box open, you can re-label each class within a field. To do this, ***click on one of the available classes under the Choose a class heading*** to highlight it. For this example, ***click on "C" and then retype "Christian" in the Legend Text field.***

After you have completed one class, ***press the Tab key*** on your keyboard. Do ***not*** click on OK or press Enter—***simply repeat the process*** so that the "J" and "M" are replaced by "Jewish" and "Muslim," respectively. ***Press Tab*** when you have finished typing the final category.

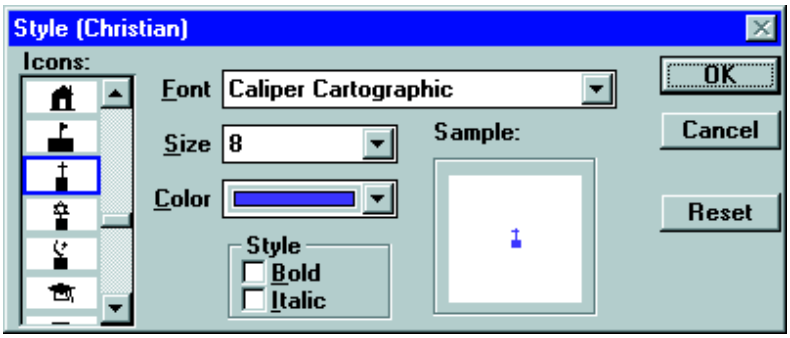


Changing the Map Symbol for Each Category

Now that you have changed the legend text for each category, you will assign new symbols to each category.

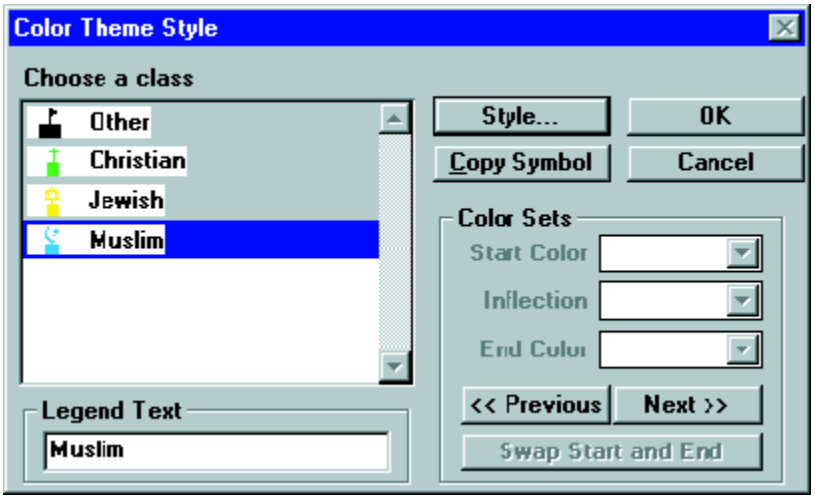
4. ***Choose one of the four classes on the left and click on Style.***

   The Style dialog box for an individual class will appear, as shown below:

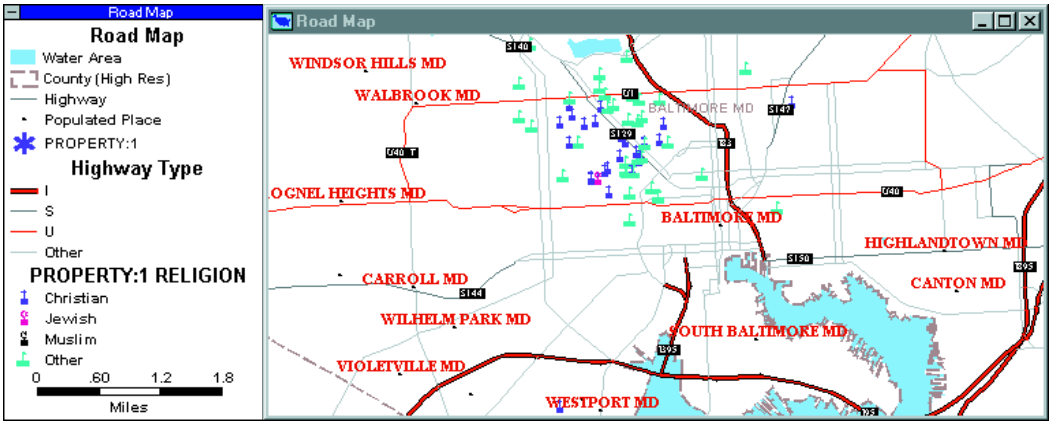


5. Under Font, ***choose Caliper Cartographic,*** then scroll through the icon list at left in the dialog box until you find the four consecutive symbols shown in the illustration above; the first of these four symbols is the building with the flag, which will represent the "Other" religious classification. **Select the icon with the cross for Christian, change the color or size if you wish,** then ***click OK.***

6. After clicking on OK, you are returned to the Color Theme Style dialog box. **Select another class** (Jewish, Muslim, or Other), ***click on Style*** again, and ***repeat the process for each class*** (choosing a different color and icon for each) until the Color Theme Style dialog box appears as shown below. Then ***click OK.***



Your map and legend should now resemble the following illustration. If your legend does not reflect the changes you made, select the Pointer tool, double-click on the legend, and make sure that the box "Thematic Maps" is selected in the Legend Settings dialog box; then click OK. If the legend still does not reflect the changes you have made, double click the Show/Hide Legend button in the Main Menu toolbar to refresh the legend. Your legend and map should now reflect the changes you have made.



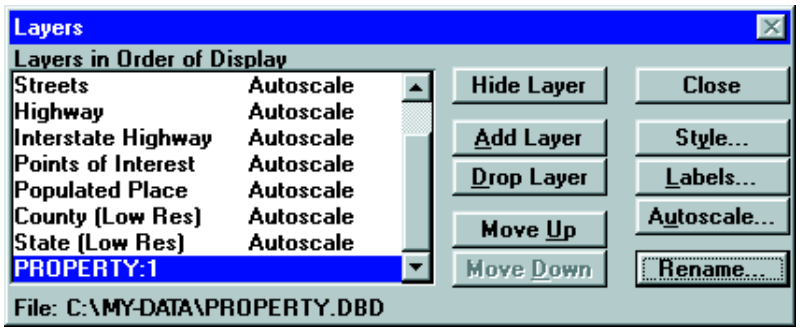
Giving the Legend a Title and Renaming the Property Layer

The legend for your map does not have a main title. A title can make the legend, and the map as a whole, more comprehensible. Also, the layer name PROPERTY:1 and the second subtitle in the legend, PROPERTY:1 RELIGION, are potentially confusing. You can remedy these shortcomings.

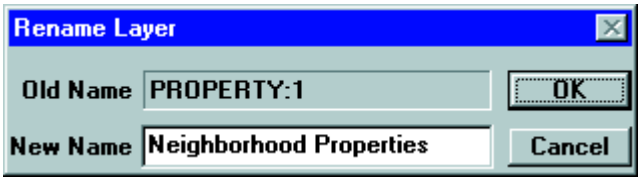
Remember that the map layer name PROPERTY:1 was created automatically by C2020 from the file name of the original table. The file name was limited to eight characters, but you can give the map layer a more informative name in the legend by using more than eight letters.

> **FYI**
>
> *Changing the map layer names does not change the name of the geographic file stored in the computer. Layer names, unlike geographic file names, are not restricted to eight characters.*

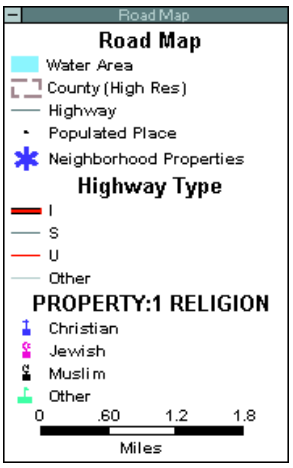
7. **Click on the Map Layers button**  on the main toolbar. **Scroll through the list** at left until the PROPERTY:1 layer is visible. ***Select PROPERTY:1, then click on the Rename button*** in the lower right corner of the dialog box.



8. The Rename Layer dialog box appears. ***Type in "Neighborhood Properties"*** in the New Name field and ***click OK.***



9. You are returned to the Layers dialog box. ***Click on Close.*** The next time your map legend is redrawn, it should look like the illustration below (to force a redraw, hide and show the legend by clicking on the **Show/Hide Legend button**  from the Main Toolbar):

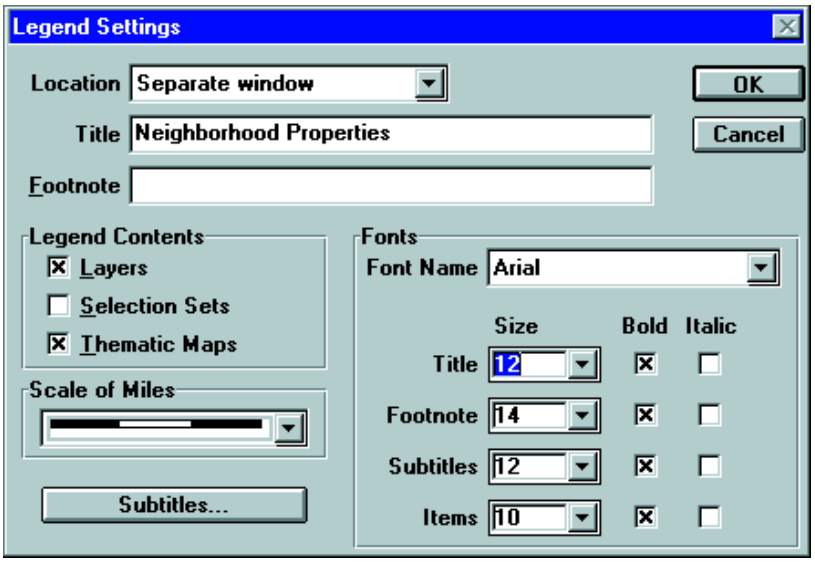


Editing the Map Legend

Next you will add a title to the map legend, edit the subtitles, and change the style of the legend text.

10. **Select the Pointer tool**  from the Maptitude toolbox and **double-click directly on the map legend.** The Legend Settings dialog box appears.

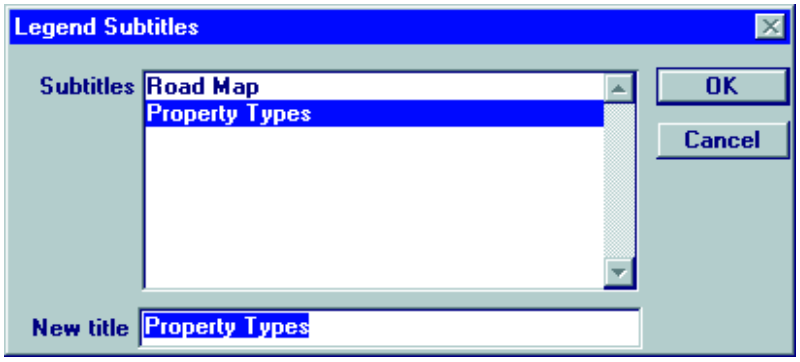
11. **Make the choices indicated below,** then **click on the Subtitles button** in the lower left-hand corner of the dialog box.



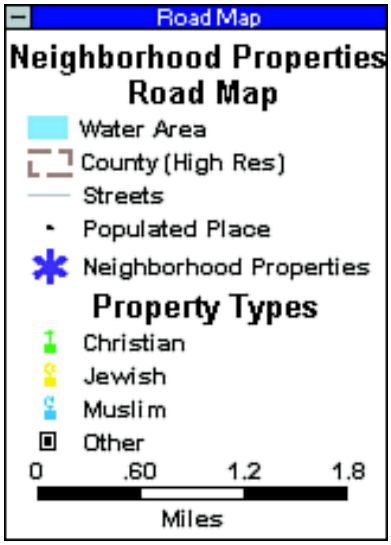
FYI

If your computer does not have the Arial font, substitute any similar font, such as Helvetica, Geneva, or Univers.

12. The Legend Subtitles dialog box appears. ***Replace the subtitle "PROPERTY 1: RELIGION" with "Property Types,"*** as shown below, then ***click OK.***



13. You are returned to the Legend Settings dialog box. ***Click OK.*** Your map legend should now resemble the one shown below:



14. **Save your map.**

Chapter 3 Summary Questions

1. Which tool do you use to reach a screen that allows you to input information and plot a property or project on a map?

   A. The User Projects tool.

   B. The Input Information tool.

   C. The Geocode tool.

   D. The Push Pin tool.

2. True or False: If the software cannot successfully locate an address from the User Projects screen, you will not be able to manually place it on a map.

3. True or False: The only fields required to import a database of locations and place them on a map are a valid street address and an accurate ZIP Code.

4. Which tool can you use to double-click on the Legend box and change the appearance of the legend?

   A) The Show/Hide Legend tool.

   B) The Text tool.

   C) The Pointer tool.

   D) None of the above.

Answers to these questions can be found at the end of the manual in Appendix B.